Squaring (1) and subtracting (2) from it, we have $xy=800\left(1-\frac{1}{\pi}\right)(2-\sqrt{2})$....(3). Now we at once get $y-x=40\sqrt{1-2\left(1-\frac{1}{\pi}\right)(2-\sqrt{2})}$....(4).

Combining (1) and (2), we finally obtain

$$x=40\left[1-\sqrt{1-2\left(1-\frac{1}{\pi}\right)(2-\sqrt{2})}\right],\quad y=40\left[1+\sqrt{1-2\left(1-\frac{1}{\pi}\right)(2-\sqrt{2})}\right].$$

Also solved by *P. H. PHILBRICK, G. B. M. ZERR, H. M. CASH, P. S. BERG, CHARLES E. MYERS, J. A. CALDERHEAD; SETH PRATT*, and *H. C. WHITAKER*.

CALCULUS.

Conducted by J. M. COLAW, Monterey, Va. All contributions to this department should be sent to him.

SOLUTIONS TO PROBLEMS.

16. Proposed by F. P. MATZ, M. Sc., Ph.D., Professor of Mathematics and Astronomy, in New Windsor College, New Windsor, Maryland.

Differentiate $\tan^{-1}\left(\frac{2x}{1-x^2}\right)$ with regard to $\sin^{-1}\left(\frac{2x}{1+x^2}\right)$.

Solution by J. F. W. SCHEFFER, A. M., Hagerstown, Maryland. and CHARLES E. MYERS, Canton, Ohio.

Let $\frac{2x}{1-x^2}=z$, then $\tan^{-1}\left(\frac{2x}{1-x^2}\right)=\tan^{-1}z$; but $\sin^{-1}\left(\frac{2x}{1+x^2}\right)$ by Trigonometry equals $\tan^{-1}\left(\frac{2x}{1-x^2}\right)=\tan^{-1}z$. Hence $\frac{dz}{dz}=1$, that is, since both expressions are identical, the first differential coefficent is=1.

Also solved by Professor *MATZ, SCHMITT*, and *ZERR*.

17. Proposed by H. W. DRAUGHON, Clinton, Louisiana.

To find the volume generated by revolving a circular segment whose base is a given chord, about any diameter as an axis.

Solution by the PROPOSER.

In the circle, center C, draw any diameter ECF, and also any chord